

and which is taken, in accordance with the experiments of Violle, as 0.104 of the Carcel lamp.

The unit of light at the Physikalisch-Technische Reichsanstalt is that given by the Hefner lamp burning at normal barometric pressure (76 cm.) in an atmosphere containing 8.8 litres of water vapour per cubic metre.

The unit of light at the National Physical Laboratory is that given by the 10-candle-power Harcourt pentane lamp, which has been prescribed for use by the Metropolitan Gas Referees, burning at normal barometric pressure (76 cm.) in an atmosphere containing 8 litres of water vapour per cubic metre.

In addition to the direct intercomparison of flame standards carried out recently by the national laboratories in Europe, one comparison was made in 1906 and two in 1908 between the American and European units by means of carefully seasoned carbon filament electric standards, and as a result of all the comparisons the following relationships are established between the above units:—

The pentane unit has the same value within the errors of experiment as the bougie decimale. It is 1.6 per cent. less than the standard candle of the United States of America, and 11 per cent. greater than the Hefner unit.

In order to come into agreement with Great Britain and France, the Bureau of Standards of America proposed to reduce its standard candle by 1.6 per cent., provided that France and Great Britain would unite with America in maintaining the common value constant, and with the approval of other countries would call it the international candle. The National Physical Laboratory, London, and the Laboratoire Central d'Electricité, Paris, have agreed to adopt this proposal in respect to the photometric standardisation which they undertake, and the date agreed upon for the adoption of the common unit and the change of unit in America is April 1, 1909.

The following simple relations will therefore hold after that date:—

Proposed new unit = 1 pentane candle.
 = 1 bougie decimale.
 = 1 American candle.
 = 1.11 Hefner unit.
 = 0.104 Carcel unit.

Therefore 1 Hefner unit = 0.90 of the proposed new unit.

The pentane and other photometric standards in use in America will hereafter be standardised by the Bureau of Standards in terms of the new unit. This, within the limits of experimental error, will bring the photometric units for both gas and electrical industries in America and Great Britain, and for the electrical industry in France, to a single value, and the Hefner unit will be in the simple ratio of 9/10 to this international unit.

The proposal to call the common unit of light to be maintained jointly by the national standardising laboratories of America, France, and Great Britain the "international candle" has been submitted to the International Electrotechnical Commission, and through it to all the countries of the world which are represented on that commission.

It is hoped that general approval will be secured, and that in the near future the term "international candle" for the new unit will have official international sanction.

NOTES.

At the anniversary meeting of the Linnean Society on Monday, the gold medal of the society was presented to Dr. F. O. Bower, F.R.S., regius professor of botany in the University of Glasgow.

WE regret to announce that Dr. G. von Neumayer, Foreign Member of the Royal Society, and for many years director of the marine observatory at Hamburg, has died at Neustadt, at eighty-four years of age.

EDMOND HALLEY, the second Astronomer Royal, died on January 14, 1742, and was buried in the churchyard of St. Margaret's, Lee by Blackheath, in the same grave as his wife, who had died five years previously. In 1854 the memorial stone being much out of repair, the Com-

missioners of the Admiralty, who by that time had the Royal Observatory in their control, evidently considered the tomb as a national monument, and replaced the stone by a new one, the old stone being removed to Greenwich Observatory, where it is now to be seen attached to a wall. By lapse of time the second stone now requires renovation, and we are glad to know that the Commissioners of the Admiralty have under consideration the question of the repairs to be done.

AN International Congress of Applied Photography is to be held from July 8–10 next at Dresden, in connection with a photographic exhibition. Particulars may be obtained from the secretary, Dr. Veisz, Winckelmannstrass, 27, Dresden.

WE regret to see the announcement, from the Berlin correspondent of the *Times*, that Prof. Wilh. Engelmann, professor of physiology in the University of Berlin, died on May 20, at sixty-five years of age. Prof. Engelmann, who held a professorship at Utrecht for many years before his removal to Berlin in 1897, was an eminent authority upon muscular and nervous, especially cardiac, anatomy.

PROF. C. D. PERRINE, of the Lick Observatory, has been appointed director of the Argentine National Observatory, Cordoba. His work with the Crossley reflector is to be taken over by Dr. H. D. Curtis, now in charge of the D. O. Mills expedition at Santiago, and the latter will be succeeded by Mr. J. H. Moore, of the Lick Observatory. Prof. Perrine will arrive at Cordoba at the end of this month, and he asks that all correspondence shall be directed to him there.

PROF. DAVID TODD, of Amherst College, Massachusetts, is about to undertake an experiment for determining the composition of the air at high levels, and the cause of mountain sickness. He intends to make several balloon ascents in a closed car from Canton, Ohio, the interior of the country being considered preferable owing to freedom from seaward air currents. Rarefied air will be pumped into the car to keep the pressure at normal. The Aéro Club of New England has offered Prof. Todd the use of its new balloon, the *Massachusetts*, of 56,000 cubic feet capacity, for the purpose of his experiments.

THE Blue Hills Meteorological Observatory, near Boston, is about to lose, by his resignation, the services of Mr. Henry Helm Clayton, who has been in charge of it since 1894, and has made it one of the most important weather stations in America. He is to be succeeded by Mr. A. H. Palmer, now at Harvard. Mr. Clayton intends to attempt shortly a balloon trip from San Francisco to the Atlantic coast, as a preliminary test of the possibilities of an air voyage over the Atlantic. He believes that he can accomplish these feats by taking advantage of an upper air current which appears to flow constantly eastward at a height of about two miles above the earth's surface.

AN incident reported from Wisconsin suggests something of the possibilities latent in "Christian science" and allied notions as a menace to public health. In the Legislature of that State there was recently introduced a Bill providing that, in connection with lessons in elementary hygiene, the pupils in the "public schools" should be taught how to avoid contagion and the commoner ailments. There immediately poured in hundreds of letters and petitions protesting against such a policy, as it would give children the impression that disease was real. The opposition was so strong that the Assembly Committee on Public Health, in spite of the efforts of three physician members, was intimidated into killing the proposal at its first hearing.

A DIRECTOR will be appointed shortly for the Australian Institute of Tropical Medicine, which has been founded to further the scientific study of the diseases peculiar to tropical Australia, and to afford opportunities for the training of medical men in this department of medicine. The institute will be situated in Townsville, Queensland, where a large and well-equipped hospital exists. The general control of the institute is vested in a committee appointed by the Universities of Sydney, Melbourne, and Adelaide, and one representative of the Government of Queensland. The director will be required to organise and administer the institute, to conduct investigations into the tropical diseases of Australia, and to give such instruction in tropical diseases as may be determined upon, and superintend research work undertaken in the laboratories of the institute. The appointment will be, in the first instance, for five years at a salary of 600*l.* per annum. The selection of the director will be made by a committee of three representing the Royal Society, the London School of Tropical Medicine, and the Liverpool School of Tropical Medicine.

LAST week we referred to the new museum, at Truro, of the Royal Institution of Cornwall. At a meeting of the institution held on May 25 it was announced that the following letter had been received from the Duchy of Cornwall Office:—"The Prince of Wales has been pleased to sanction a donation of 200 guineas from the Duchy revenue to the fund for a new county museum at Truro. His Royal Highness directs that the donation may be given in memory of Sir Humphry Davy and Richard Trevithick, two great Cornishmen who commenced their careers with few advantages and left names which can never be forgotten. His Royal Highness hopes that with increased facilities for the study of science and art the great traditions of the Duchy may be more than maintained."

In his article on "The Government and Aëronautical Research" in *NATURE* of May 13 Prof. Bryan remarked:—"The Aëronautical Society mainly exists for the purpose of promoting discussions on aëronautical matters." Mr. Eric S. Bruce, late honorary secretary of the society, writes to say that, from the days of its foundation in 1866, the society has had wider objects and aims than merely debate. Experiments have been encouraged, a "well-illustrated" journal has been published, and it is hoped that a well-equipped aëronautical laboratory may before long be established. "Another special object has been the establishment of a comprehensive aëronautical library, and many of the important works on aëronautics in various languages have already been collected." Prof. Bryan has favoured us with the following remarks upon the subject of Mr. Bruce's letter:—"No difference of opinion can possibly exist as to the value of libraries, laboratories, practising grounds, and properly conducted experiments in furthering the progress of aëronautics. But while the Aëronautical Society deserves full credit for all that it has done in the right direction, it would be invidious to single it out without referring in equal detail to claims of a similar or different kind possessed by the other two bodies under discussion. The Aëro Club also has its experimental ground, while the Aërial League attaches the greatest importance to scientific research, which it proposes to further by founding and endowing a college. If this movement receives the support which it deserves, that institution should certainly become the leading authority on all scientific developments of aëronautics. In the accounts of the amalgamation given in the daily

papers a claim to that position was put forward on behalf of the Aëronautical Society. But the right of a society to rank among the leading scientific bodies must necessarily depend largely on the maintenance of a uniformly high standard of scientific value and accuracy in the communications published in its Proceedings, and an examination of the Journal shows that such a claim could not be admitted unchallenged in the columns of *NATURE* any more than the description of the Journal as 'well illustrated' could be allowed to pass without referring to the figures on pp. 52, 53, of the April number. For this reason the sentence quoted by the energetic and enterprising ex-secretary was chosen after careful consideration as indicating the special and distinguishing characteristics of the society better than any statement of a more ambitious character."

WHAT is perhaps the largest prehistoric relic found in England has just been secured for the Hull Municipal Museum. This is the well-known "dug-out" boat found during excavations at Brigg, Lincs, in 1886. The boat is cut from a single piece of oak, more than 48 feet in length and 6 feet in width—a much larger size than any oak tree living in Britain to-day. With the boat were found many interesting relics, and these have also been presented by Mr. V. Cary-Elwes. Mr. T. Sheppard, the curator of the museum, has successfully removed the boat to its new quarters, where it forms a welcome addition to the already large series of Lincolnshire antiquities.

A MAGNETIC storm of some size was recorded at Kew during May 14 and 15. It commenced suddenly at about 5.0 a.m. on May 14, the initial change of horizontal force—about 70 γ in five minutes—being unusually large. The total range was about 400 γ in horizontal force and 54' in declination. The largest and most rapid changes took place between 4 p.m. and 6 p.m. on May 14. Westerly declination diminished by about 48' between 5.12 p.m. and 5.18 p.m. The vertical force was continuously in excess of its normal value between 2 p.m. and 10 p.m. on May 14, the excess not falling short of 100 γ between 2.40 p.m. and 8.40 p.m. There were no large movements after 4 a.m. on May 15, but the curves remained somewhat disturbed until the evening. There was a marked appearance at times of continuous oscillatory movements of the type which usually accompany aurora.

In his recent discourse at the Royal Institution, which we hope to publish in an early issue, Prof. Ronald Ross referred to the neglect of malaria prevention for ten years in many British possessions. In answer to a question upon the subject asked by Mr. Ramsay MacDonald in the House of Commons a few days ago, Colonel Seely referred him to the report of the advisory committee for the Tropical Diseases Research Fund for the year 1907 (Cd. 3992) containing reports relating to malaria. He added:—"These reports show, I regret to say, that nothing of any consequence had been done in the direction indicated at that time. The reports in question have, with the rest of the matter contained in the Blue-book, been brought to the notice of the schools of tropical medicine, but action to be effective must needs be taken by the Governments concerned, with the cooperation of the general community."

In the House of Commons on May 20 Mr. Balfour asked the Prime Minister whether he could state the nature of the duties entrusted to the scientific committee on aërial navigation, and explain the relation of the committee to the executive officers who were understood to be

designing balloons and aeroplanes for naval and military purposes. In answer to the question Mr. Asquith said:—"It is no part of the general duty of the advisory committee for aeronautics either to construct or to invent. Its function is not to initiate, but to consider what is initiated elsewhere, and is referred to it by the executive officers of the Navy and Army construction departments. The problems which are likely to arise in this way for solution are numerous, and it will be the work of the committee to advise on these problems, and to seek their solution by the application of both theoretical and experimental methods of research."

ON Tuesday next, June 1, Dr. F. Gowland Hopkins will begin a course of two lectures at the Royal Institution on "Biological Chemistry"; on June 3 Prof. W. E. Dalby will commence a course of two lectures on "A Modern Railway Problem: Steam *v.* Electricity"; and on Saturday, June 5, Dr. F. F. Blackman will deliver the first of two lectures on "The Vitality of Seeds and Plants," (1) "A Vindication of the Vitality of Plants," (2) "The Life and Death of Seeds." The Friday evening discourse on June 4 will be delivered by Prof. J. A. Fleming, on "Researches in Radio-telegraphy," and on June 11 by Sir James Dewar, on "Problems of Helium and Radium." An extra discourse will be delivered on June 18 by Mr. A. Henry Savage Landor, on "A Recent Visit to the Panama Canal."

WE have received a copy of a special report on the establishment and organisation of a research laboratory at the Crichton Royal Institution, Dumfries, which has been submitted to the board of direction by Dr. C. C. Easterbrook, the physician superintendent. It is suggested that the laboratory shall be devoted to study and research in nervous and mental disorders. Dr. Easterbrook proposes that three Crichton fellowships be established for the promotion of psychiatric research, one in clinical neurology and psychology, one in pathology and chemistry, and one in pathology and bacteriology. Each fellowship should be, he maintains, of the value of 250*l.* a year with residence in the institution, or 50*l.* additional in lieu thereof. Particulars are given of what might well be the general qualifications and previous training of candidates, and indications are supplied of how such fellows could, by working in a research laboratory, benefit the institution as well as medical science.

IN a note upon changes in the staff and administration of the London Zoological Gardens which appeared in NATURE of May 13, it was announced that the curators will have to devote their whole attention and time to the care of the animals under their charge, and therefore "will have no time to spend on scientific zoology." Dr. Chalmers Mitchell, secretary of the society, writes to say that while it is certainly intended that the first duty of the curators shall be the care of the living animals in their charge, "such work opens as wide a field for research in 'scientific zoology' as the anatomical and systematic investigations to which, by implication, the writer of your note would seem to restrict the phrase." He is convinced that "the council will welcome the scientific work of the staff in whatever direction that may be, so long as it is compatible with the discharge of their duties." In the *Times* announcement of the changes it was stated that the curators were expected to devote all their energies to "curating," an expression which the writer of the note took (and still takes) to mean that they were not to spend time on scientific work.

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THE British Fire Prevention Committee, which was founded on the occasion of the great Cripplegate fire of 1897 and incorporated in 1899, is celebrating the tenth anniversary of its incorporation this week. The greater knowledge of building materials and appliances obtained by scientific independent tests at the committee's testing station has done much to obtain a better understanding of the value and also the limitations of different methods of construction and equipment, whilst considerable influence has also been exerted by the committee in guiding building and fire service legislation in directions where it is most effective to prevent loss of life and loss of property. The objects tested by the committee since its formation numbered 160 to the end of last year, and it should be understood that the investigation into any one object sometimes requires as many as twenty or thirty testing operations. Notable tests have been those with large reinforced concrete floors, a series of fifty fire-resisting doors, fire-resisting glazing, and latterly also with safety devices. Perhaps a final feature that claims remark is that the whole of the funds required for the establishment of the committee's testing station and the execution of its work have been raised voluntarily, that more than 20,000*l.* have been expended in ten years on the work of the committee, and that the whole of the services rendered by the committee and its officers are voluntary.

SOME interesting details of the scientific achievements of the British Antarctic Expedition under Lieut. Shackleton are given in Monday's *Times*. The communication is from the New Zealand correspondent of the *Times*, and is based upon information provided by Prof. Edgeworth David. From the article we learn that a number of the rotifers found in the lake muds were of the same variety as those already described by the biologist of the expedition (Murray) in Spitsbergen and Franz Josef Land. This was especially the case in regard to the species *Macrobrotus arcticus*. A point of special interest in regard to the marine fauna near Cape Royds is that it may provisionally be concluded that it bears some distant resemblance to the types of animal life of the Coal-measure series of Australia and Tasmania. The possibilities of the Antarctic having been an archipelago can no longer be entertained. There is a high continental plateau extending from the new mountains recently discovered by the *Nimrod* expedition forty-five miles west of Cape North to the magnetic pole across the plateau traversed by Captain Scott of the *Discovery*, and over the portion traversed by Lieut. Shackleton in his furthest south journey to beyond the South Pole itself—probably for a distance of 1800 miles. The most interesting geological discovery was that of Coal-measures at least 1500 feet thick in latitude 85° S. There were at least seven seams of outcrop in the cliff face of the great nunatak where the discovery was made; they varied in thickness from 1 foot to 7 feet. Abundant small fossil root impressions were present in the fire-clay found with some of the seams. The general geological results of the expedition show that there is a very ancient series of crystalline rocks similar to those already described by Ferrar, of the *Discovery*, forming the foundation platform from near the South Pole to Cape North. The whole of this basal series gives every promise of minerals of the rare earths in more or less abundance. Superimposed upon these basal beds is the sandstone formation already described by Ferrar as the "Beacon" sandstone. Above the sandstones, on a series of volcanic rocks, occur immense lava sheets more or less horizontally bedded. As regards volcanic eruptions, it is interesting to note that

Erebus, like Stromboli in the Mediterranean, formed a good barometer, for as the mercury fell in the barometers of the expedition so did the steam cloud over Erebus rise higher and higher. Nearly all the principal steam eruptions took place when the barometer was at its lowest.

WE have to acknowledge the receipt of vol. v., part ii., of the *Boletim do Museu Goeldi (Museu Paraense)*, the greater portion of which is devoted to botanical subjects, although there is one paper, by Dr. Emilia Snethlage, on new Amazonian birds in the collection of the museum, and a second by the same author on certain new fishes from the Amazon and its tributaries, recently described by Dr. Steindachner.

THE categories of variation form the subject of the first and longer article, by Prof. S. J. Holmes, in the May number of the *American Naturalist*. After directing special attention to mutations, the author concludes as follows:—"If sudden mutations have been a not uncommon source of varieties of domesticated animals and cultivated plants, it does not follow that the selection of comparatively small variations has not been the predominant method of species-forming in a state of nature. After fifty years from the publication of Darwin's 'Origin of Species' we are still debating, and more lively than ever, the central problem of that epoch-making book; but it is not improbable the views of its sagacious author will prove more nearly correct than those of most of his modern critics."

In describing, under the name of *Isocrinus knighti*, a new crinoid from the Upper Jurassic of Wyoming, we are glad to see that Mr. F. Springer, in No. 1664 of the Proceedings of the U.S. National Museum (vol. xxxvi., pp. 179-99), decides not to replace the well-known name *Encrinurus liliiformis* or to transfer it to another species, although, according to strict interpretation of rules, there may be grounds for so doing. "I shall maintain," he writes, "that, irrespective of the merits of their original titles to priority, the names of *Encrinurus* and *Millericrinurus* have become valid simply by the lapse of time, by long usage in the sense in which they are now generally understood; and that by reason of universal acquiescence in such use for nearly a century, zoologists are now estopped from disputing them." These are golden words, and it is most satisfactory to find that Mr. Boulenger's revolt against the priority-fetish has spread to America, where the fetish is most highly worshipped. We trust the revolt will continue to spread.

BROWN-BEAR hunting in Alaska forms the subject of a very fully illustrated article, by Mr. G. Mixer, in the April number of the *National Geographic Magazine*, the article concluding with an extract of a report on these bears by Mr. W. H. Osgood. After mentioning that Alaska is unrivalled in regard to the number and variety of its bears, and that the brown bears are the largest in the world, with the exception of the Polar species and their own relations in Kamchatka, the latter author considers that the days of these bears are numbered, and that these animals will ere long be exterminated except in the more remote districts. The brown bears vary greatly in colour, ranging from dark seal-brown to buffish-brown, with the legs and under-parts generally darker than the back. Although the ends of the hairs are often paler than the bases, the silver-tipped fur of the grizzlies is never seen, while the front claws are shorter, thicker, and more sharply curved than those of the latter.

THE osteology and affinities of the Jurassic American iguanodont reptiles of the genus *Camptosaurus* form the

subject of a long paper, by Mr. C. W. Gilmore, published as No. 1666 of the Proceedings of the U.S. National Museum (vol. xxxvi., pp. 197-332). As the result of additional materials, the author is enabled to give a new definition of the genus, while special attention is also directed to the three English reptiles which have been assigned to the genus by Mr. Lydekker. All three are admittedly very nearly allied to the American genus, and the author at present sees no reason for separating the Kimeridgian *C. prestwichi*, although in certain points it comes closer to *Iguanodon* than to the typical *Camptosaurus*. On the other hand, the femur from the Oxfordian on which *C. leedsi* was founded appears to come nearer to the corresponding bone of the American *Dryosaurus*, and the species may therefore be distinct from *Camptosaurus*, the same remark applying to the still more imperfectly known *C. valdensis* of the Wealden of the Isle of Wight.

WE have been favoured with parts of the *Journal botanique de la Société impériale des Naturalistes* of St. Petersburg (Nos. 2 to 6, 1908). Papers on the algae of the Black Sea are contributed by Mr. K. N. von Deckenbach and Mr. N. N. Woronichin. The former provides new records for species and localities; the latter, a more extensive paper, deals with the identification of green algae from several collections, and supplies a list of nearly fifty species, but none of them is endemic. Two articles on the distribution of plants are contributed, the one, by Mr. J. Perfiliew, on the government of Wologda, the other, by Miss H. Poplavska, on the government of Pskov. A genus, *Luenovia*, is created by Mr. W. Sukatscheff for a new blue-green alga under the order Hormogoneæ.

ADDITIONAL notes on the economic aspects of the oil palm, *Elaeis guineensis*, are given in the current issue (No. 4) of the *Kew Bulletin*, compiled from information supplied by officers in Nigeria, Sierra Leone, Gambia, and the Gold Coast. The chief factors affecting habitat are a rainfall of more than 70 inches and a soil rich in humus but well drained. Plantations are only occasionally met with, as among the Krobos of the Gold Coast, but there is no difficulty in raising young plants. The method of tapping the palms for "wine," which tends to the destruction of numbers of trees, is described. At the present time, and until transport facilities are improved the sources of supply are more than adequate.

PROF. C. F. CHAMBERLAIN has supplemented his paper on the female gametophyte of the cycad *Dioon edule* by an account, published in the *Botanical Gazette* (March), of spermatogenesis in the same plant. The staminate cones measure 10 cm. to 20 cm. in length; the numerous sporophylls bear about 250 sporangia, and the average output of a sporangium is placed at 30,000 spores. One persistent prothallial cell is developed. The sperms, produced in pairs in a mother-cell, are only slightly smaller than the sperms of *Zamia*, and, like them, are just visible to the naked eye, as they measure about 1/40-inch. The movement of cilia is accompanied by pulsating and amœboid movements. Two blepharoplasts are formed which eventually break up into granules from which the spiral ciliated band of the sperm is developed.

AN account of trees on the Dawyck estate, in Peebles, by Mr. W. B. Gourlay, is published in the latest number (vol. xxiii., part iv.) of the Transactions and Proceedings of the Botanical Society of Edinburgh, in which it is stated that larches were planted on this estate in 1725, or thirteen years before the first introduction to Dunkeld; the survivors are much weather-beaten, but the estate lies

in an extremely cold region. Silver fir, *Abies pectinata*, grows well, and some large trees, one of which reaches a height of 115 feet, date back to the year 1735. Two horse-chestnuts, said to be the first planted in Scotland, probably date back a few years earlier. Plantations of the common larch are subject to disease, but the Japanese larch is healthy, and the Douglas fir thrives in sheltered situations.

THE classic experiments by Moll concerning the absorption of carbon dioxide from the air will be familiar to most botanists, more especially as illustrations are given in Vines's "Physiology of Plants." The experiment where a leaf was inserted between two glass dishes has been further investigated by Dr. V. Zijlstra, who has embodied his results in a brochure on the transport of carbon dioxide in leaves. He finds that when part of a leaf is placed in an atmosphere devoid of carbon dioxide, and the adjacent part of the leaf is covered, then the carbon dioxide formed in this part of the leaf in respiration diffuses through the leaf, and a band of starch is formed beyond the screen. The band varies from 5 mm. in the dahlia to 2.5 cm. in wheat, while through the leaves of *Eichhornia* and *Pontederia* the gas can diffuse much more readily.

IN the May number of *Man* Dr. F. C. Shrubbsall describes two crania and some long bones from ancient ruins in Rhodesia. The skulls seem to be of the Bantu, not of the Bushman, type; in other words, they belong to a negro race similar to the inhabitants of Rhodesia at the present day. The position in which these remains were found seems to indicate that they were coeval with the buildings near which they were discovered. While this does not, of course, prove that negroes were the builders of the famous ruins, it is significant to note that the remains do not belong to any of the more northern races. The fact that the bones were associated with valuable gold ornaments precludes the supposition that these negroes had been enslaved by the foreigners, who, according to one theory, were the builders of these remarkable structures.

WE have received copies of two fasciculi, one dealing with *Oligochaeta* and *Hirudinea*, and the other with *Nematodes*, *Gordiidae*, &c., of *Die Süsswasserfauna Deutschlands, eine Exkursionsfauna* (Jena: G. Fischer). The parts (of which those before us are respectively numbered 13 and 15) are sold separately, at a price varying between one and two shillings each, and they are issued in narrow duodecimo form, so as to be convenient for carrying in the pocket. Each part is, moreover, written by a specialist, and sufficiently, although diagrammatically, illustrated, and the whole work appears, therefore, to be admirably adapted for the purpose for which it is intended, namely, as a companion for the field-naturalist.

THE report of the Bombay and Alibag observatories for the year 1908 has been received. White ants cause much damage at the Colaba (Bombay) Observatory; glass insulators filled with kerosene have been provided for the presses containing the records, but it is doubtful if they will prove efficacious. The rainfall for the year amounted to 53.54 inches, being 21.62 inches below the average for 1873-96; of that amount, 52.70 inches fell between June and September inclusive, the period of the south-west monsoon. Milne's seismograph registered forty-eight earthquakes, besides several small movements; great disturbances occurred on January 11, February 9, August 20, and November 2. A table prepared in accordance with the suggestion of the International Commission for Terrestrial Magnetism, representing the magnetic character

of each day, shows that there were 135 calm days, the remaining days of the year showing small or larger disturbances; six of the latter were days of great disturbance. The mean declination was $1^{\circ} 2'$ east.

THE ballistic galvanometer method of measuring quantities of electricity has proved so convenient and flexible that it has been used to determine changes of magnetic induction in cases to which it was not strictly applicable. According to the simple theory of the instrument, the whole of the electricity must have passed through it before the moving part of the instrument has had time to move appreciably from its position of rest. Prof. O. B. Pierce, of Harvard, has investigated the behaviour of a d'Arsonval galvanometer the period of swing of which was raised to ten minutes by attaching to the coil a circular disc with a weighted rim. He finds that the simple theory is still applicable to such an instrument, and has by means of it measured the changes of magnetic induction through large electromagnets. His memoir forms No. 11 of vol. xlv. of the Proceedings of the American Academy of Arts and Sciences.

SOME comparison tests between the new Féry spiral pyrometer and a standardised thermoelectric Féry radiation pyrometer are recorded in *Engineering* for May 14. The spiral pyrometer has the advantage over other types of radiation pyrometers in that it is self-contained. The instrument consists essentially of a very small spiral made of a strip of two metals having very different coefficients of expansion, and having a pointer attached. The spiral unrolls when heated, and the pointer travels over a scale indicating the temperature of the furnace. Rays coming from the furnace are reflected by a concave mirror and sent to the spiral, any radiation passing through the spiral being reflected back to it by means of a second small mirror. The whole is contained in a tube furnished with a focussing arrangement by means of which the observer directs the instrument towards the furnace and obtains an image of it. Adjustment of the zero of the instrument is easily effected. The tests were conducted by Mr. G. C. Pearson in the retort-house of the Birmingham Gas Works, and ranged between 845° C. and 1260° C. The greatest difference between the readings of the two instruments amounted to 10° C. at 930° C.; the mean of twelve readings shows the spiral pyrometer to be reading about 1° C. in excess of the thermoelectric pyrometer. The maker's claim of an accuracy within 1 per cent. or 2 per cent. is thus amply justified. The instrument is being constructed in this country by the Cambridge Scientific Instrument Company.

A SERIES of special demonstrations on the use of microscopes, and various microscopic appliances and accessories, has been held during the past week or so at the London dépôt, 9-15 Oxford Street, of Mr. Ernest Leitz, of Wetzlar. It is generally known that this firm was practically the pioneer in the production of cheap microscopes and objectives of Continental make, and an inspection of the apparatus now shown clearly indicates that, though a low standard of price is maintained, the apparatus produced is of a very high class. It is interesting to note that in the production of the new types of microscope stands the firm is being largely influenced by English ideas of design; the result is a type of instrument which combines to a considerable extent the Continental horse-shoe foot and the much more stable English tripod foot. Could Mr. Leitz carry this innovation somewhat further, he would be in a position to produce an instrument which in point of design and for general stability and convenience

in use would have few equals and probably no superiors. The episcopic and diasopic projection apparatus is of a very complete order, and admits of being used for photomicrographic work as well. The dark ground illuminators, and also some recently introduced appliances for metallurgical work, are of special interest. An entirely new design of apparatus, adapted for both visual and photographic purposes in metallurgy, is also exhibited, and in this a definite departure from existing methods is to be seen. The microtomes are also of new design, and are of very substantial construction. A visit to the premises of Mr. Leitz at the present moment cannot fail to be of interest to microscopists, or to those to whom the microscope may be of either practical or scientific value.

MR. JOHN MURRAY has just issued the fourth edition of Mr. W. C. D. Whetham's book on "The Recent Development of Physical Science." The book was published first in 1904, and was noticed in NATURE of January 26, 1905 (vol. lxxi., p. 291). The present issue is fundamentally the same as the third edition published four years ago, though a few additions have been made.

No. 168 of Ostwald's *Klassiker der exakten Wissenschaften*, published by Mr. W. Engelmann, Leipzig, contains papers on the stereoscope by Wheatstone, Brewster, Riddell, Helmholtz, Wenham, d'Almeida, and Harmer, edited and annotated by Mr. M. von Rohr. The volume makes an interesting contribution to the history of the stereoscope for German readers.

THE thirteenth revised and enlarged edition of "Prantls Lehrbuch der Botanik," edited by Prof. F. Pax, has been published by Mr. W. Engelmann, Leipzig. The text has been extended, and now occupies nearly five hundred pages. The price—six marks—for a volume of this number of pages, and almost the same number of figures, is remarkably low.

PROF. R. ZSIGMONDY's valuable work upon the application of the method of ultramicroscopy to the study of solutions of colloids has been translated into English by Mr. T. Alexander, and published by Messrs. J. Wiley and Sons (London: Chapman and Hall, Ltd.) under the title "Colloids and the Ultramicroscope." An appreciative notice of the original German work appeared in NATURE of March 1, 1906 (vol. lxxiii., p. 410). The price of the English edition is 12s. 6d. net.

OUR ASTRONOMICAL COLUMN.

A GENERAL SOLUTION OF THE SPECTROHELIOGRAPH.—A paper by M. Deslandres, published in No. 15 of the *Comptes rendus*, describes a "general purposes" spectroheliograph recently set up at Meudon in which are combined four distinct instruments for the photographic registration of the phenomena of the solar atmosphere. All these instruments are fed by the same coelostat and objective.

The first is an ordinary spectroheliograph giving the forms of the flocculi in H α light, the dispersion and reflection being performed by a reflection grating. If the grating be removed from the path of the collimated ray the latter falls on a train of prisms, which deviates it into a second camera of 3 m. focal length giving K β and K γ images, for comparison with the H α images, of 80 mm. diameter.

If it is desirable to isolate a special line the camera objective of the second instrument is replaced by a plane mirror, so that the ray is reflected into the third spectroheliograph arranged for the easy isolation of any special radiation, whilst if this instrument be removed the ray passes into the fourth instrument, of much greater length

and having three slits, so that very fine lines, or definite portions of broad lines, may easily be isolated. It is with the latter form that M. Deslandres has recently obtained the fine images, with K β and H α radiations, showing the dark filaments.

The requisite motions are imparted to the objective forming the primary image, and to the photographic plate, by synchronised electric motors and speed transformers, and M. Deslandres states that the change from one instrument to another is a simple matter; the complications are more apparent than real.

THE BRIGHTNESS OF THE CORONA.—Lick Observatory Bulletin No. 153 contains a brief review, by Prof. Perrine, of the results obtained from the attempts to measure the total brightnesses of the corona during the total solar eclipses of 1905 and 1908.

Among other things, it is shown that the ratio of the intrinsic actinic brilliancy of the brightest parts of the corona to that of the surrounding sky is 744/1, whilst the ratio of total coronal, to full moon, light is 0.111. The results also indicate that there are sufficient differences of brightness of the corona at successive eclipses to be detected by the methods employed at Flint Island in 1908.

A STANDARD SCALE OF PHOTOGRAPHIC MAGNITUDES.—In Circular No. 150 of the Harvard College Observatory Prof. Pickering points out the urgent importance of fixing upon some standard scale of photographic magnitudes for international adoption, and describes the work already done in this connection at Harvard. The method of polar sequences, in which the region to be investigated is photographed on the same plate and under the same conditions as the polar region, has been found to give satisfactory results, and the absolute magnitudes of a sequence of forty-seven stars in the latter region have been determined. Other sequences are being prepared, and Prof. Pickering states that the Harvard College Observatory is prepared to devote a large part of its resources to the work if a satisfactory scale can be universally adopted.

THE ORIGINS OF SATELLITES.—In a telegram to the *Astronomische Nachrichten* (No. 4323, May 17), Prof. See announces that he has rigorously demonstrated that satellites were all captured, and states that he is sending a paper setting forth his demonstration.

THE SPECTRUM OF MOREHOUSE'S COMET.—With a quartz spectrograph attached to the 80-cm. refractor of the Potsdam Observatory, Prof. Hartmann obtained a spectrum of comet 1908c on October 27, 1908; the exposure was 140 minutes, and the slit width 0.1 mm. Three faint pairs of lines are shown at wave-lengths 3874.2, 3908.6; 4001.1, 4020.0; and 4252.8, 4275.8. The first of these is very broad, and corresponds to the head of the third cyanogen band, whilst the origins of the other pairs are as yet unknown (*Astronomische Nachrichten*, No. 4322).

THE ORBIT OF ξ BOÖTIS.—An orbit for ξ Boötis, previously published by Prof. Doberck, was determined by aid of Sir Wm. Herschel's position angles, and no longer represents the observations. Consequently, Prof. Doberck has determined a new orbit, using only the measures made since 1830, and publishes it, together with an ephemeris until 1915.5, in No. 4322 of the *Astronomische Nachrichten*; the following are the elements:— $\Omega = 171^\circ 37'$, $\lambda = 346^\circ 52'$, $\gamma = 32^\circ 54'$, $e = 0.5061$, $P = 179.60$ years, $T = 1907.84$, $a = 5.015''$, retrograde. The hypothetical parallax of this system is 0.158".

THE BIRTH OF WORLDS.—In *Cosmophysics*, "an international journal of astrophysics," described as the organ of the Wainoni Park Astrophysical Society, Christchurch, New Zealand, Prof. A. W. Bickerton sets forth his complete theory of stellar creation. Numerous recent observations of stars, novæ and their spectra are introduced into this summary in order to demonstrate that lucid stars are formed by the collision of two cosmical masses. The new body, however, is not the combined mass, but, according to Prof. Bickerton's theory, is a third body formed by the masses detached from the colliding bodies by the force of the impact; the latter, after their impact, go on their respective journeys as variable stars.